and smell), and the reporting of the same to the nervous centres of the animal, from whence the intelligence is sent out to the spines and pedicellariæ, which latter are at once alert to secure the food-substance.—The nerve-terminations in the cutaneous epithelium of the tadpole, by A. B. Macallum (plate 6). The results are summarised as follows:—(1) Certain fibres of the nerve network, situated below the corium, and known as the fundamental plexus, give origin to fibres which enter the epithelium, and terminate in comparatively large bead-like bodies between the cells. (2) From a network of fine anastomising nerve-fibrils situated immediately below the epithelium, and forming meshes, each narrower than the surface covered by an epithelial cell, arise other excessively fine fibrils, which end either within or between the cells or after branching, in both fashions. (3) One, commonly two, often three or more, nerve-fibrils terminate in the interior of each epithelial cell near its nucleus. (4) The figures of Eberth are sheaths for intracellular nerve terminations.—On green oysters, by Prof. E. Ray Lankester (plate 7). The occurrence of a species of Navicula in the intestine of the green oysters of Marennes, is confirmed. The bluish pigment in the Navicula is described as "Marennin." The description and illustration of the secretion-cells of the epithelium of the branchiæ and labial tentacles of the oyster in which the Marennin absorbed in the intestine of green oysters is deposited follows, and it is proved that it is to this substance that the green parts owe their colour. The green oyster is very beautifully figured, of natural size, from a sketch by Miss A. Stone. The bluish pigment is, in the early spring, of a decidedly green hue.—The system of branchial sense-organs and their associated ganglia in Ichthyopsida: a contribution to the ancestral history of Vertebrates, by Dr. John Beard (plates 8–10).

American Journal of Science, December 1885.—On the effect on the earth's velocity produced by small bodies passing near the earth, by H. A. Newton. It is shown that the effect upon the earth's motion caused by the meteors that penetrate the earth's atmosphere, exceeds at least one-hundredfold that caused by the meteors that pass by without impact.—Sources of trend and crustal surplusage in mountain structures, by Alexander Winchell. The general meridional trend of the older mountain systems is discussed, and the cause of this orographic disposition is referred to the early period of incrustation. It is also argued that meridional trends would be further promoted by the secular subsidence of the earth's equatorial protuberance, as well as by lunar tidal action.—The genealogy and the age of the species in the Southern Old Tertiary, part iii., reply to criticisms, by Otto Meyer. In reply to Prof. Hilgard, the author maintains with further argument the original contention that only a competent and careful examination of the fossils could indicate the relations of the Old Tertiary strata of Mississippi. He also endeavours to show that Prof. Hilgard's views on the stratigraphical succession below Claiborne, Jackson, and Vicksburg are incorrect.—The condensing hygrometer and psychrometer, by Henry A. Hazen. Objections are raised against the condensing hygrometers now in use, such as those of Mr. Dines and Crova. An efficient psychrometer is described, with instructions for its use, and a table of relative humidity applicable to the sling psychrometer.—A new form of absorption cell, by Arthur E. Bostwick. The cell here described has been devised and used by the author for the purpose of obtaining the absorption-spectra of liquids, which have little selective absorption, and which would therefore have to be used ordinarily in large quantities.—Preliminary notice of fossils in the Hudson River slates of the southern part of Orange County, New York, and elsewhere, by Nelson H. Darton. Here the author deals with the fossils discovered in many new localities, which have thrown much light on the complicated stratigraphic structure of these districts.—Report of the American Committee-Delegates to the Berlin International Geological Congress, held September 28 to October 3, 1885, by Persifor Frazer, Secretary.—Bright lines in stellar spectra, by O. T. Sherman. Bright lines hitherto admitted to form part of but six stars, β Lyræ, γ Cassiopeiæ, and four small stars in Cygnus, are now detected by the 8-inch equatorial of Yale College Observatory in numerous other stars, a full description of which awaits the completed apparatus. The number of approximate coincidences renders it very probable that the lines observed are those of the solar atmosphere, and from these observations it would seem that there are many stars in the same condition as the sun, but with the corona more pronounced.—Note on the optical properties of rock-salt, by S. P. Langley. The most perfect rock-salt prisms procurable in Europe fail to show distinctly a single Frauenhofer line. But, after long searching, blocks have at last been obtained in America, from which prisms have been cut which show these lines with all the sharpness of flint glass. The prism here described, which has been made by Brashear of Pittsburgh, shows the nickel line between the D's.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, December 17, 1885.—"Second Report on the Evidence of Fossil Plants regarding the Age of the Tertiary Basalts of the North-East Atlantic." By J. Starkie Gardner. Communicated by Sir J. D. Hooker, K.C.S.I., F.R.S.

The position and physiography of this headland in the Isle of Mull has been fully described by the Duke of Argyll. It is the point of land separating Loch Laigh and Loch Scridain, and is about two miles in circumference and a mile across.

It is composed mainly of two sheets of basalt with remains of a third sheet, on some eminences and along the shore of Loch Laigh. These are almost horizontal, with a slight dip east, up Loch Scridain, and a considerable dip in the same direction up Loch Laigh. The upper sheet is not less than 40 to 50 feet thick, crystallised into rude massive columns, now much fissured and weathered, whilst the lowest presents a thickness of 60 feet, visible above low water, the upper two-thirds being amorphous, and the rest fashioned into slender and most perfect columns, bent in every direction, like those of the Clam-shell cave at Staffa. The beds are so exceedingly horizontal towards the seaward direction, that no one can doubt the columnar basalts of Staffa and the Treshnish Isles, Geometra and the mainland of Mull, being on the same horizon, if not parts of the same sheet. Between the two great lava-beds at Ardtun is intercalated a bed of sedimentary deposit, reaching a maximum of 60 feet thick, and consisting of pale very fine-grained clay and limestone at the base, then sand and gravel, black laminated shales, whinstone, gravel, and laminated sands. The gravels are made up of flint pebbles and subangular rolled fragments of older lava-beds in a matrix of broken-down volcanic material. They present all the ordinary lines of current bedding, beautifully weathered out, and the pebbles are drifted precisely as in ordinary river gravels.

There can be no question whatever, indeed, but that the gravels are the deposits of the waterway of a river of some magnitude, and the shales its overflows and backwaters. Its deposits traverse the whole seaward face of the headland, and their extension inland is marked by two beds of coal. An intrusive sheet of fine compact basalt rises on one side of the head, cutting a devious way through each bed in turn, and dipping beneath the sea at the other extremity. On the coast, near the centre of the head, occurs a small chine, apparently due to the weathering out of a vertical dyke, which has cut through the gravels and shales; it was here that I resolved to excavate them.

With the assistance of a barrel of powder and the removal of a mass of the intensely indurated shingle bed, to the extent of perhaps hundreds of tons, many square yards of the whinstone and the underlying black shales were exposed. The large specimens of *Platanites aceroides* and *Onoclea hebridica*, now exhibited, were the results. The ravine, however, proved an unfortunate selection, for the whinstone became poorer in fossils as we got farther in, and the underlying black shales, though crowded with leaves, were so squeezed and full of slickensides or faulted surfaces, and, consequently, so brittle, as to be practically valueless. From the condition of the shales and calcined appearance of the gravels—here of a steely-gray colour, intensely hard, with pure white and occasionally cherry-coloured flints, it is evident that the ravine must be the site of an old dyke, and if proof were wanting of a violent upthrust at this spot it is to be found in the upturned edges of the bottom bed on the west face. The succession of beds in the section we had been so laboriously working at in the ravine in no way prepared me for the discovery that within 100 yards there existed, many feet below the lowest sedimentary bed present in the ravine, a deposit of limestone, rivalling in fineness and texture the celebrated lithographic stone of Solenhofen, and containing exquisitely-preserved leaves, completely different in character to any previously seen in the basalts.

The new flora differs considerably from that of the shales above, and very large leaves of many kinds occur in the clay at the base. The leaves in the limestone are smaller and very sparsely scattered through it; there are, moreover, no cleavage planes, and hence much patience is required to obtain and develop them. I have obtained about twenty species of dicotyledon from it, the most prevalent being *Grewia crenata*, Hr., and *Corylus MacQuarrii*, Forbes, and *Acer arcticum*, Hr., all of which are also found in beds of the same age in Greenland. There are no ferns and only three conifers, a large variety of *Ginkgo adiantoides*, Unger., a new *Podocarpus*, the most northerly species found, and *Taxus Campbelli*. The fragments from the clays show about eight additional species, and altogether I should judge that both floras were very rich. The most characteristic plants of the shales are those described by the Duke of Argyll and Edward Forbes, *Platanites aceroides* and *Rhamnites multinervis*. *Taxites Campbelli* is not, as affirmed by Heer, identical with *Sequoia Langsdorfii*, but is a true *Taxus*. Other leaves are certainly referable to *Protophyllum*, and we have representatives of leaves determined as *Alnus*, *Cornus*, *Berchenia*, *Populus*, and *Corylus*—but among them there are none, so far as I can ascertain, that have ever been found in European beds of Miocene age. The flora seems to bear a *primâ facie* resemblance to Cretaceous floras of America rather than to any yet known from Europe. The resemblance of the Coniferæ to those indigenous to China at the present day is too remarkable to be overlooked.

It has become evident that the fluviatile rocks of the British basalts are of far greater extent and importance than had hitherto been imagined. Their base is exposed at Burg Head on the opposite side of Loch Scridain, resting upon Jurassic rocks and fragmentary masses of chalk, and is formed of two immense sheets of ash, the lowest of which is full of scoriæ. About 100 feet above these, resting upon columnar basalt, are sands and clays from 9 to 12 feet thick, in every respect similar to those of Ardtun Head. Overlying these is a bed of rudely columnar basalt, and there cannot be much doubt about the fluviatile series on both sides of the loch being upon the same horizon. The beds are, in fact, seen to be horizontal to the west as far as the eye can reach. The horizon of the Ardtun gravels would, therefore, seem to be about 150 feet from the base of the series. Taking into account the superior thickness of the basalts in Mull, and above all the presence of ash-beds at their base, it seems probable that they were nearer the vents than Antrim, and that their lowest beds are at least not newer, so that the Mull leaf-beds at 150 feet from the base should be much older than the Glenarm and Ballypalady leaf-beds at 600 feet from the base.

The horizontal extent of the fluviatile beds of Mull is more difficult to estimate. Gravels and fluviatile beds exist in many localities, and black shales, with identical leaves, have been found in Canna, and leaflets of *Taxus* or a similar foliaged conifer at Uig.

A very interesting relic of the Eocene vegetation occurs at Burg, for a large tree, with a trunk 5 feet in diameter, has been enveloped as it stood to a height of 40 feet, by one of the underlying lava-beds. Its solidity and girth enabled it to resist the fire, but it subsequently decayed, leaving a hollow cylinder filled in with debris, and lined apparently with the charred wood. There is also the limb of a larger tree in a fissure not far off. The wood proves to be coniferous, belonging possibly to the *Podocarpus*, whose leaves are so conspicuous in the beds above.

Mathematical Society, January 14.—Mr. J. W. L. Glaisher, F.R.S., President, in the chair.—Mr. J. B. Colgrove, Loughborough Grammar School, was elected a Member, and Mr. S. O. Roberts was admitted into the Society.—Mrs. Bryant, D.Sc., read a paper on logarithms in general logic. An animated discussion followed between the author and Mr. Kempe, F.R.S., in which Prof. Sylvester, the President, and Mr. S. Roberts, F.R.S., also took part.—Mr. J. Hammond (Prof. Sylvester in the chair) read a paper on a class of integrable reciprocants (see report of Prof. Sylvester's Oxford lecture in NATURE, January 7, p. 222).—Capt. Macmahon made a short communication also bearing on reciprocants.

Chemical Society, December 17, 1885.—Dr. Hugo Müller, F.R.S., President, in the chair.—The following circular letter was read by the Secretary:—

Elizabeth Thompson Science Fund.—This Fund, which has been established by Mrs. Elizabeth Thompson, of Stamford, Connecticut, "for the advancement and prosecution of scientific research in its broadest sense," now amounts to 25,000 dollars. As the income is already available, the trustees desire to receive applications for appropriations in aid of scientific work. This endowment is not for the benefit of any one department of science, but it is the intention of the trustees to give the preference to those investigations, *not already otherwise provided for*, which have for their object the advancement of human knowledge, or the benefit of mankind in general, rather than to researches directed to the solution of questions of merely local importance.

Applications for assistance from this fund should be accompanied by a full statement of the nature of the investigation, of the conditions under which it is to be prosecuted, and of the manner in which the appropriation asked for is to be expended. The applications should be forwarded to the Secretary of the Board of Trustees, Dr. C. S. Minot, 25, Mt. Vernon Street, Boston, Mass., U.S.A.

The first grant will probably be made early in January, 1886.

(Signed) H. P. BOWDITCH, *President*.
WM. MINOT, Jun., *Treasurer*.
FRANCIS A. WALKER.
EDW. C. PICKERING.
CHARLES SEDGWICK MINOT, *Secretary*.

The following papers were read:—The action of steam on carbonic oxide, by H. B. Dixon. The action of steam in determining the union of carbonic oxide and oxygen has been explained by the author as leading to an alternate reduction and oxidation whereby the hydrogen conveys the oxygen to the carbonic oxide:—(1) $Co + H_2O = CO_2 + H_2$; (2) $2H_2 + O_2 = 2H_2O$. This explanation has been rejected by Moritz Traube (*Ber.*, 1885, p. 1890) on the ground that carbonic oxide does not decompose steam at a high temperature. Traube represents the influence of steam as consisting in the formation from it of peroxide of hydrogen, which oxidises carbonic oxide, steam being re-formed. The author has already shown that steam is decomposed by carbonic oxide at a high temperature, for when carbonic oxide is exploded in presence of steam with insufficient oxygen to completely burn it, the carbon dioxide formed is more than double the oxygen, and hydrogen is found in the residue. Horstmann arrived at the same conclusion. When sparks are passed through a mixture of steam and carbonic oxide, carbon dioxide and hydrogen are formed until a certain fraction (which varies with the nature of the spark) of the carbonic oxide is turned into carbon dioxide. When sparks are passed through a mixture of carbon dioxide and hydrogen, carbonic oxide and steam are formed until a certain fraction of the carbon dioxide is turned into carbonic oxide. In neither case is the reaction complete. An equilibrium is reached when about 10 per cent. of carbon dioxide is present to 90 per cent. of carbonic oxide. By the prolonged passage of the sparks a considerable quantity of formic acid is produced. When a coil of platinum wire is heated to redness in steam and carbonic oxide, carbon dioxide and hydrogen are formed until from 10 to 15 per cent. of the carbonic oxide has been oxidised. Similarly, when a coil of platinum wire is heated in carbon dioxide and hydrogen, carbonic oxide and steam are formed until the corresponding limit is reached. No formic acid is produced. When a coil of wire is maintained at a red heat in a mixture of carbonic oxide and steam, and the carbon dioxide formed is removed by means of a dilute solution of potash, the carbonic oxide is in time completely oxidised to carbon dioxide with the liberation of the corresponding volume of hydrogen. Similarly, when a coil of platinum wire is maintained at a red heat in a mixture of carbon monoxide and hydrogen, and the steam formed is removed by means of phosphoric oxide, the carbon dioxide is in time completely reduced to carbonic oxide. Since these experiments were made Naumann has shown that when carbonic oxide and steam are heated in a tube to 950°, 10·5 per cent. of carbonic oxide is turned into carbon dioxide.—On multiple sulphates, by Miss E. Aston and S. U. Pickering.—On the use of ferrous sulphate in agriculture, by A. B. Griffiths, Ph.D.—On phenyltribromomethane, $C_6H_5.CBr_3$, by Walter H. Ince.

Institution of Civil Engineers, January 12.—Sir Frederick J. Bramwell, F.R.S., President, in the chair.—The paper read was "On Gas Producers," by Mr. Frederick John Rowan.

EDINBURGH

Mathematical Society, January 8.—Dr. R. M. Ferguson, President, in the chair.—Mr. R. E. Allardice discussed a problem of symmetry in an algebraical function.—Mr. A. Y. Fraser gave an account of the methods for the quadrature of areas, especially by planimeters. He exhibited and described several of these instruments, including two of his own invention.

MANCHESTER

Literary and Philosophical Society, October 12, 1885.—Microscopical and Natural History Section.—Mr. Thomas Alcock, M.D., President of the Section, in the chair.—Prof. Boyd Dawkins, F.R.S., brought before the notice of the Section rock-specimens and microscopic slides illustrating the structure of the clay-slate of Snaefell in the Isle of Man.—Mr. Stirrup exhibited a small slab of the flexible sandstone of India.

SYDNEY

Royal Society of New South Wales, October 7, 1885.—Prof. Liversidge, F.R.S., President, in the chair.—Mr. Charles Moore, F.L.S., read a paper on the ringal of the North-West Himalayas, by Mr. Brandis (communicated by Baron von Müller, K.C.M.G.). Specimens of the bamboos now in this country were shown.—Prof. Liversidge exhibited a portion of a brick, the surface of which was green. The discolouration, he explained, was due to the presence of vanadium salts.

November 5.—Prof. Liversidge, F.R.S., President, in the chair.—The President referred to the loss the Society had sustained in the death of the senior Vice-President, the Hon. Prof. Smith, M.D., C.M.G., M.L.C.—Dr. Morris read some notes upon a very large number of experiments made with the view of discovering media having a higher refractive index than Canada balsam for the mounting of *Amphipleura pellucida*.—Mr. S. H. Cox, F.C.S., F.G.S., read some notes on the character of the Adelong Reefs.—The Rev. P. MacPherson described a collection of stone implements used by the Aborigines of Australia.—The Hon. J. M. Creed exhibited a pestle and mortar, used by the Aboriginals on the Murray River for grinding seeds.—Mr. H. C. Russell exhibited a new and simple form of tide-gauge.

PARIS

Academy of Sciences, January 11.—M. Jurien de la Graviere, President, in the chair.—Obituary notice of M. de Saint-Venant, Member of the Section for Mechanics, who died at Vendôme on January 6, by the President.—A new method for determining the elements of refraction, with a view to a more approximately correct knowledge of the true position of the heavenly bodies, by M. Lœwy. For this method it is claimed that it is extremely simple and direct, dispensing with the necessity of simultaneously ascertaining the value of any other quantity. It is also independent of any instrumental error, relying solely on differential measurements—that is, on operations by which alone a high degree of precision can be obtained.—Note on the constitution of the solar spots and on photography regarded as an instrument for discoveries in astronomy, by M. J. Janssen. These remarks are made in connection with a photographic image, presented by the author to the Academy, of the large spot visible on the solar disk on June 22, 1885, which was one of the largest hitherto observed. The image fixed on the photographic plate was formed with the violet rays of the region G, which affect the retina very feebly; hence, without the aid of photography, could scarcely ever be detected, even with the most powerful telescopes.—Note on the exceptional magnetic disturbance recorded by the magnetic registrar at the Observatory of the Parc Saint-Maur on January 9, by M. Mascart.—On the various states of the sulphur of antimony, which exists normally in two distinct states—that of a black crystallised sulphur, such as occurs in nature, and the orange hydrated sulphur obtained by precipitation, by M. Berthelot.—On the reciprocal actions and the equilibria established between the hydrochloric and hydrosulphuric acids and the salts of antimony, by M. Berthelot. It is shown: (1) That the inverse actions are produced in cases where the sign of the heat liberated by the reaction of two bodies, such as the sulphur of antimony and hydrochloric acid, is changed by the combination of one of them with a third body, such as water-forming hydrates, or even with one of the products of the reaction; (2) that the chemical action is not reversed abruptly, but according to a certain gradation of intermediate compounds, such as the hydrates, hydrosulphates, hydrochlorides, &c.; (3) that these secondary compounds exist for the most part only in a state of partial dissociation; (4) that they determine and regulate the chemical equilibria between the antagonistic bodies, according to the conditions of their own existence and dissociation; at this point intervene the physico-chemical laws of dissociation, which are at present being so actively investigated by chemists. — On alternating semi-anæsthesia regarded as a symptom of certain lesions of the rachidian bulb, by M. Vulpian.—Note on some meteorites which fell in the Hissar district, Punjab, on February 19, 1884, and at Chandpur, near Mainpuri, North-West Provinces, on April 6, 1885, by M. Daubrée. Both specimens, supplied to the author by Mr. Medlicott, of the Indian Geological Survey, appear to belong to the type of sporadic siderites, with respective densities 3·40 and 3·25.—Application of the transport of power by electricity in the cannon foundry of Bourges, by M. Favé. Since 1879 two movable cranes of 20 tons have been worked by electricity in this establishment without any accident.—Note on an arrangement of lenses with a great diameter and short focus presenting a very slight aberration, due to the late Col. Mangin, communicated by the Minister of War. The system consists of three lenses with a diameter of 0·60 metres, one bi-convex, the two others concavo-convex, having a resulting focal distance of about 1 metre. The curves are so calculated that there is nowhere a deviation of light of more than 2° 30′; and as the three lenses have no great thickness, the loss of light passing through them is scarcely one-twelfth, a loss more than compensated by the gain from the reduction of aberration.—Observations on Brooks's new comet made at the Paris Observatory (equatorial of the west tower), by M. G. Bigourdan.—Observations of the same comet made at the Observatory of Nice (Gautier's equatorial), by M. Charlois.—Summary of the solar observations made during the second half of the year 1885, by M. P. Tacchini. A progressive and rapid diminution of the solar spots was observed during the whole year, and especially during the last quarter. The faculæ were also less numerous, but the protuberances rather more frequent than in the previous six months.—On the propagation of sound in a cylindrical tube, in supplement to the labours of Regnault on this subject, by MM. Violle and Vautier. The main result of the experiments carried on in an underground conduit at Grenoble was that the velocity of propagation seemed to decrease with the intensity of the sound.—On the variations of the spectra of absorption and of the spectra of emission by the phosphorescence of the same body, by M. Henri Becquerel.—Note on the hydrates of hypophosphoric acid, by M. A. Joly. From the author's experiments this substance would appear to be as sharply determined by its crystallised hydrates as the phosphoric and phosphorous acids, and in the solid state it is fully as stable.—On the solubility of the sulphate of copper in presence of the sulphate of ammonia, by M. R. Engel.—On some combinations of acetimide with the metallic chlorides, by M. G. André.—Oh the preparation, properties, and reactions of iodaldehyde—

$$5C_2H_4O) + 4I + IO_3H = 5(C_2H_3IO) + 3H_2O,$$

by M. P. Chautard.—On the amylaceous granules of the cystosome of the gregarines, by M. E. Maupas.—On chlorophyll action (absorption of carbonic acid and emission of oxygen) in ultra-violet darkness, by MM. G. Bonnier and L. Mangin.—Verification of the existence of glacial formations in Equatorial Africa (Gold Coast between Cape Palmas and the Bight of Benin), by M. Chaper.—On the physiological action of the salts of lithium, rubidium, and potassium, by Mr. James Blake. It is shown that the relative toxic properties of the salts of lithium and rubidium increase with the atomic weight.—Researches on the coagulation of albumen, by M. Eug. Varenne.—Experiments showing that under certain conditions the charbon virus becomes attenuated in the ground, by M. V. Feltz.—On the transmission of glanders from mother to fœtus, by MM. Cadéac and Malet.—On the cultivation of wheat in the districts of Wardrecques (Pas-de-Calais) and Blaringhem (Nord), by MM. Porion and Dehérain.

BERLIN

Physical Society, Nov. 6, 1885.—Starting from the classical experiments of Bunsen and Roscoe respecting the action of light on a mixture of chlorine and hydrogen, Dr. Pringsheim had by recent experiments endeavoured to obtain a closer insight into the mode of the action of light. Light, as was known, was absorbed to a definite amount by chlorine, while hydrogen had a coefficient of absorption almost equal to zero. When now light passed through a mixture of chlorine and hydrogen, a part of the light was, in the first place, absorbed by the chlorine, just as though this gas were the only element through which it passed, and in all probability this absorbed amount was transformed into heat. In addition to this effect, on the other hand, the chemical affinity of the gases got excited, and in order to this operation light was likewise absorbed. Whether in this process we had a direct action of light-rays transformed into heat or only a kind of releasing influence on the part of the rays was a point that had yet to be determined. The difficulty of this determination was enhanced by the fact of the induction which Bunsen and Roscoe had already ascertained, in accordance with which the chemical combination of the chlorine with the hydrogen did not take place at once, but only a longer or shorter time after the beginning of the irradiation. By taking the gas-layer of great thickness Dr. Pringsheim was enabled to augment the time of the induction to twenty minutes, and the combination of the two gases was effected only in the twenty-first minute of the irradiation. For his experiments Dr. Pringsheim made use of a gas-developing apparatus in which concentrated hydrochloric acid underwent electrolysis by means of iridium electrodes, and from which the gases passed through a tube into a globular irradiation space whence a capillary, divided into millimetres, led to a vessel filled with water, from which, again, a thread of water penetrated into the capillary, and so served as index of the gas-pressure obtaining in the apparatus. Any heating influence expanded the gases and pushed the index outward, while as often as hydrochloric acid was formed—the acid being at once absorbed by the water that was present in the insolation-globe—it caused an advance of the index, and the measure of this advance served as a criterion of the amount of acid formed. Experiments were next instituted in regard to the nature of the induction, and investigation was made as to whether it were identical with the chemical action of the light or were somewhat different from it. Sources of light of different intensity and different colour were examined in respect of their chemical and their inductive action, and it always turned out that the rays of most intense chemical action produced likewise the greatest induction. In the measurements of the chemical action of light, which were then taken in hand, a petroleum lamp was used as a source of light, the warm rays of the petroleum lamp being eliminated by means of an intercalated layer of water. Dr. Pringsheim first observed a sudden movement of the index outwards, which was at once followed by a speedy retirement to the initial position, and from this point the index was then observed proceeding slowly inwards, in proportion as muriatic acid was formed and absorbed. Seeing the first movement of the index might be interpreted as an effect of heat, control experiments were instituted with momentary illumination, at first by dropping a dark screen with small slit before the flame, and then by means of electric sparks. Each time now that the light ray struck the chlorine hydrogen gas mixture, the index was seen pushing suddenly outwards, and then as suddenly reverting to its former position, whence it then slowly retired inwards. There could, therefore, be no question in this case of any heating, but there must, on the contrary, be some other cause in operation, to the determination of which other experiments should be devoted.—Dr. König spoke on colour-blindness, and, in particular, on the important light it would throw on the theory of colours if, in addition to cases of red and green blindness, the existence of violet blindness could be demonstrated. Hitherto violet-blind persons had been described only by Herren Donders and Holmgren. These gentlemen had examined abnormal eyes, which, in the spectrum between red and green, saw a circumscribed gray band, exactly at the spot where, in the case of the violet-blind, the two remaining curves of colour-sensitiveness intersected each other. Last year, for the first time, Dr. König had an opportunity of examining an intelligent boy of from thirteen to fourteen years of age, who likewise testified to a quite distinct gray band in the spectrum between green and red, while he saw all other colours accurately. The belief that here was a case of a violet-blind person was, however, materially shattered when the spectral violet was presented quite pure and isolated before the boy. He then said he saw a colour which he had never before seen in his life. The boy was, therefore, not incapable of perceiving violet rays. Later, Dr. König had occasion to examine an eye affected with central turbidity of the retina, an eye which—so far as the experiments that were capable of being executed only with great care, allowed the determination of the matter—was, in point of fact, violet-blind. On investigating the neutral point, it was found with very great precision at the wave-length, 560·14. According to theory, the intersecting point of the red and green curve lay at 563·5 wave-length, very fairly, therefore, in agreement with the value thus found. The measurements of intensity between the wave-lengths 560 and 470 yielded values which likewise coincided exactly with those given theoretically for bichromatically violet-blind eyes. The now considerably more exact method for examining the colour-blind and the significance of these ascertained facts in relation to the theory would be set forth by Dr. König on a future occasion.—In the discussion which the first communication called forth, Prof. Landolt made the proposal of using a solution of lithium chloride in order to obtain, by way of electrolysis, a perfectly pure chlorine hydrogen gas mixture. In the case of electrolysis of hydrochloric acid there was a danger, he represented, of oxygen being united with the gas mixture. Prof. von Helmholtz said that the influence of the rays of light on the chlorine and hydrogen molecules might be conceived by supposing that they acted in a manner similar to that of elastic balls executing oscillations in a high-standing flat vessel, whereby they were continually passing up and down. Did one ball receive on some occasion or other a stronger impulse than usual, then it leaped over the edge and fell to the ground; so that in respect of the totality of movements in the vessel, a part of the energy was lost. In the same way, when an atom of chlorine and hydrogen approached so close to each other that they united chemically, a part of the energy of the oscillations of light became lost. In reference to the second communication (that of Dr. König), Prof. von Helmholtz set forth the difficulties of investigations of the kind in question, and laid special stress on a psychological difficulty. It was known that only the central part of the retina was trichromatic. With the part of the retina attaching itself peripherically, only two colours were seen, while the extreme region of the retina was monochromatic. Nevertheless, we always saw a white surface as white, whatever part of the retina were struck by these rays. It was plain that we had learned by experience to perceive objects that appeared white in the central field as white likewise when at the periphery they stimulated only two or but one kind of fibres. In all investigations into colour-blindness this psychological point was one which ought to be taken into quite material account.

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